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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
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Fishery Publications, Calendar Year 1967: Lists and Indexes

LEE C. THORSON and MARY ELLEN ENGETT

SEATTLE, WA
JULY 1973

National Marine Fisheries Service, Circulars

The major responsibilities of the National Marine Fisheries Service (NMFS) are to monitor and assess the abundance and geographic distribution of fishery resources, to understand and predict fluctuations in the quantity and distribution of these resources, and to establish levels for optimum use of the resources. NMFS is also charged with the development and implementation of policies for managing national fishing grounds, development and enforcement of domestic fisheries regulations, surveillance of foreign fishing off United States coastal waters, and the development and enforcement of international fishery agreements and policies. NMFS also assists the fishing industry through marketing service and economic analysis programs, and mortgage insurance and vessel construction subsidies. It collects, analyses, and publishes statistics on various phases of the industry.

The NOAA Technical Report NMFS CIRC series continues a series that has been in existence since 1941. The Circulars are technical publications of general interest intended to aid conservation and management. Publications that review in considerable detail and at a high technical level certain broad areas of research appear in this series. Technical papers originating in economics studies and from management investigations appear in the Circular series.

NOAA Technical Reports NMFS CIRC are available free in limited numbers to governmental agencies, both Federal and State. They are also available in exchange for other scientific and technical publications in the marine sciences. Individual copies may be obtained (unless otherwise noted) from NOAA Publications Section, Rockville, Md. 20852. Recent Circulars are:

315. Synopsis of biological data on the chum salmon, *Oncorhynchus keta* (Walbaum) 1792. By Richard G. Bakkala. March 1970, iii + 89 pp., 15 figs., 51 tables.

319. Bureau of Commercial Fisheries Great Lakes Fishery Laboratory, Ann Arbor, Michigan. By Bureau of Commercial Fisheries. March 1970, 8 pp., 7 figs.

330. EASTROPAC Atlas: Vols. 4, 2. Catalog No. I 49.4:330/(vol.) 11 vols. ($4.75 each). Available from the Superintendent of Documents, Washington, D.C. 20402.

331. Guidelines for the processing of hot-smoked chub. By H. L. Seagran, J. T. Graikoski, and J. A. Emerson. January 1970, iv + 23 pp., 8 figs., 2 tables.

332. Pacific hake. (12 articles by 20 authors.) March 1970, iii + 152 pp., 72 figs., 47 tables.

333. Recommended practices for vessel sanitation and fish handling. By Edgar W. Bowman and Alfred Larsen. March 1970, iv + 27 pp., 6 figs.

335. Progress report of the Bureau of Commercial Fisheries Center for Estuarine and Menhaden Research, Pesticide Field Station, Gulf Breeze, Fla., fiscal year 1969. By the Laboratory staff. August 1970, iii + 33 pp., 29 figs., 12 tables.

336. The northern fur seal. By Ralph C. Baker, Ford Wilke, and C. Howard Baltzo. April 1970, iii + 19 pp., 13 figs.

337. Program of Division of Economic Research, Bureau of Commerecial Fisheries, fiscal year 1969. By Division of Economic Research. April 1970, iii + 29 pp., 12 figs., 7 tables.

338. Bureau of Commercial Fisheries Biological Laboratory, Auke Bay, Alaska. By Bureau of Commercial Fisheries. June 1970, 8 pp., 6 figs.

339. Salmon research at Ice Harbor Dam. By Wesley J. Ebel. April 1970, 6 pp., 4 figs.

340. Bureau of Commercial Fisheries Technological Laboratory, Gloucester, Massachusetts. By Bureau of Commercial Fisheries. June 1970, 8 pp., 8 figs.

341. Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N.C., for the fiscal year ending June 30, 1968. By the Laboratory staff. August 1970, iii + 24 pp., 11 figs., 16 tables.

342. Report of the Bureau of Commercial Fisheries Biological Laboratory, St. Petersburg Beach, Florida, fiscal year 1969. By the Laboratory staff. August 1970, iii + 22 pp., 20 figs., 8 tables.

343. Report of the Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas, fiscal year 1969. By the Laboratory staff. August 1970, iii + 39 pp., 28 figs., 9 tables.

344. Bureau of Commercial Fisheries Tropical Atlantic Biological Laboratory progress in research 1965-69, Miami, Florida. By Ann Weeks. October 1970, iv + 65 pp., 53 figs.

346. Sportsman's guide to handling, smoking, and preserving Great Lakes coho salmon. By Shearon Dudley, J. T. Graikoski, H. L. Seagran, and Paul M. Earl. September 1970, iii + 28 pp., 15 figs.

347. Synopsis of biological data on Pacific ocean perch, *Sebastodes alutus*. By Richard L. Major and Herbert H. Shippen. December 1970, iii + 38 pp., 31 figs., 11 tables.

Continued on inside back cover.

U.S. DEPARTMENT OF COMMERCE
Frederick B. Dent, Secretary
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
Robert M. White, Administrator
NATIONAL MARINE FISHERIES SERVICE

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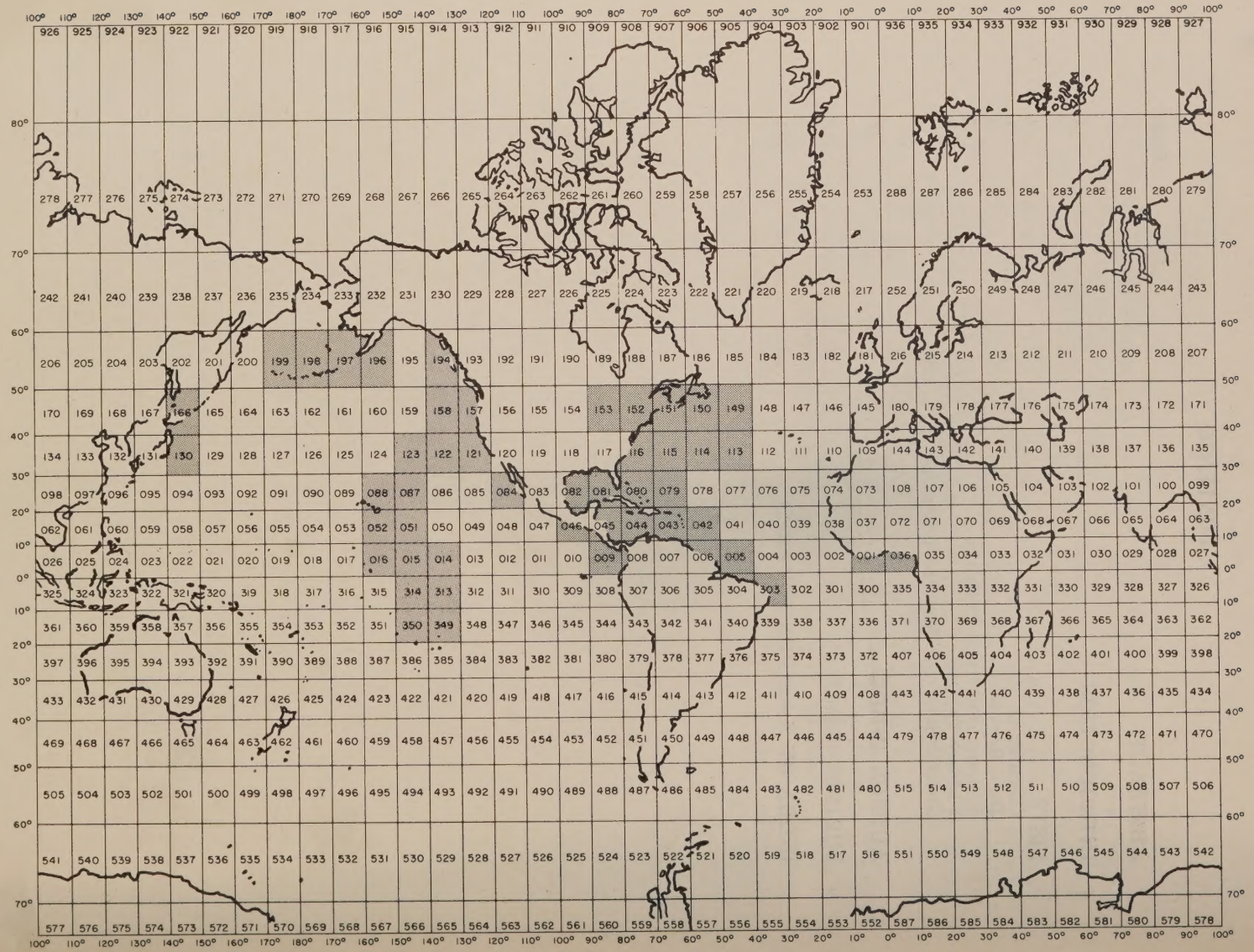

FIGURE 1.—Marsden square grid showing geographic areas (shaded) covered by fishery publications, calendar year 1967.

FISHERY PUBLICATIONS, CALENDAR YEAR 1967: LISTS AND INDEXES

By

LEE C. THORSON and MARY ELLEN ENGETT

Scientific Publications Staff
National Marine Fisheries Service

ABSTRACT

The following series of fishery publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration (until October, 1970 the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service) in calendar year 1967 are listed numerically (with abstracts) and indexed by author, subject, and geographic area: Circular, Data Report, Fishery Industrial Research, Fishery Leaflet, and Special Scientific Report–Fisheries.

INTRODUCTION

This document provides for calendar year 1967 numerical lists (with abstracts) and indexes by author, subject, and geographical area, the following series of publications of the National Marine Fisheries Service, National Oceanic and Atmospheric Administration, which until October 1970 was the Bureau of Commercial Fisheries of the U.S. Fish and Wildlife Service:

Circular
Data Report
Fishery Industrial Research
Fishery Leaflet
Special Scientific Report—Fisheries

The document is divided into four principal sections:

Numerical listing of series (with abstracts)
Author index
Subject index
Index by Marsden Squares

The last section has been included to afford easy access to the publications for those persons interested in specific geographical areas. Figure 1 shows the Marsden squares treated in the several publications.

The series abbreviations used in the indexes are:

Circular	C
Data Report	D
Fishery Industrial Research.	FIR
Fishery Leaflet	FL
Special Scientific Report—Fisheries	S

LISTS

Circular

252. Field guide to the snappers (Lutjanidae) of the western Atlantic. By William D. Anderson, Jr. January 1967, iii + 14 pp., 29 figs., 2 tables.

ABSTRACT

This guide is intended to implement both field and laboratory identification of western Atlantic snappers (Lutjanidae). Eight genera and 27 species, of which 7 are of doubtful validity, are considered. Illustrated keys are supplemented by tables that give the ranges of numbers of fin rays, lateral line scales, and gill rakers.

253. Published in 1966.

254. Published in 1968.

255. Oceanographic atlas for Tampa Bay, Florida, and adjacent waters of the Gulf of Mexico. 1958-61. By Alexander Dragovich and James E. Sykes. March 1967, 466 pp., 1,200 figs., 1 table.

ABSTRACT

The atlas contains profile sections depicting the distribution of some oceanographic properties in Tampa Bay, Fla., and adjacent waters of the Gulf of Mexico for the period October 1958 to August 1961. Isopleths are given in vertical section for temperature, salinity, and sea-water density (sigma-t). Inorganic phosphorus (PO_4-P), total phosphorus (total-P), nitrogen (NO_3-N) and (NO_2-N), copper (Cu), silicon (SiO_3-Si), and *Gymnodinium breve* (the Florida red-tide organism) are also given in vertical section, but numerically rather than as isopleths.

256. Published in 1968.

257. Report of the Bureau of Commercial Fisheries Biological Laboratory St. Petersburg Beach, Florida Fiscal Year 1966. By James E. Sykes. August 1967, 18 pp., 14 figs., 2 tables.

ABSTRACT

This is the third fiscal report of the Bureau of Commercial Fisheries Biological Laboratory, St. Petersburg Beach, Fla. Progress in Estuarine and Red-Tide Research Programs is described by project. The application of biological information toward the maintenance and conservation of estuarine zones is stressed. The programs are designed to document the relatively unknown scope of biological productivity in the coastal zones of the eastern Gulf of Mexico, to measure the effect of changes in these zones, and to develop methods of increasing marine organisms which can be used by man.

258. Published in 1968.

259. Steps to effective sanitation in smoked-fish plants. By Jack B. Dougherty and Harry L. Seagran. April 1967, iii + 12 pp., 13 figs.

ABSTRACT

Effective sanitation procedures for use in smoked-fish plants are briefly described. Included are sections pertaining to plant design, construction, and maintenance; water and waste systems; cleaning and sanitizing methods and materials; personal hygiene; and problem areas to avoid in regard to bacterial contamination of finished product.

260. Report of the Bureau of Commercial Fisheries Biological Laboratory, Gulf Breeze, Florida Fiscal Year 1966. By Philip A. Butler and Robert F. Johnson. June 1967, iii + 15 pp., 12 figs., 2 tables.

ABSTRACT

The program of the Laboratory has been concerned since 1958 with evaluating the effects of pesticides—primarily synthetic organic chemicals—on marine plants and animals. Projects are designed to determine existing pollution levels, concentrations causing acute and chronic effects, and the translocation of residue in the biota and environment.

261. The Miller Freeman, fishery research vessel of the United States of America. By Kenneth N. Thorson and Rae R. Mitsuoka. April 1967, 4 fan-fold.

(No abstract.)

262. Report, Technological Laboratory Bureau of Commercial Fisheries Pascagoula, Mississippi for fiscal year ending June 30, 1966. By Travis D. Love and Mary H. Thompson. September 1967, iv + 14 pp., 8 figs., 7 tables.

ABSTRACT

Results of research on the composition and nutritive value of seafoods, the processing difficulties encountered with shrimp, and methods for the removal of pesticide residues from seafoods are described. Microbiological studies on microorganisms of public health significance and *Salmonella* in fishery products are presented, as are the results of the survey of the Gulf of Mexico for the presence of *Clostridium botulinum*. Other activities of the Laboratory staff are acknowledged as are the staff publications for fiscal year 1966.

263. Field guide to the flatfishes of the family Bothidae in the western North Atlantic. By Elmer J. Gutherz. October 1967, iv + 47 pp., 48 figs.

ABSTRACT

Keys are presented to facilitate both field and laboratory identification of the 14 genera and 47 species in the family Bothidae from the western North Atlantic, particularly those south of Cape Hatteras, N.C. Illustrations for all species (except *Bothus ellipticus*), the salient familial and subfamilial characteristics, and short descriptions with geographic and bathymetric ranges are given.

264. Report of the Bureau of Commercial Fisheries Biological Laboratory, Beaufort, N.C. for the fiscal year ending June 30, 1966. By Kenneth A. Henry. September 1967, iv + 30 pp., 21 figs., 10 tables.

(No abstract.)

265. Progress in exploratory fishing and gear research in Region 2 fiscal year 1966. By Harvey R. Bullis, Jr. and John R. Thompson. September 1967, iii + 14 pp., 17 figs.

ABSTRACT

Activities of the past year included explorations by the R/V *Oregon* in the South Atlantic Ocean and Caribbean Sea, collection of data on shrimp behavior, and work on other research projects.

266. The West German research vessel *Walther Herwig*. By Ernest D. McRae, Jr. September 1967, iii + 23 pp., 20 figs.

ABSTRACT

The *Walther Herwig* is a modern fishery research vessel built for the West German Government and launched in 1963. The vessel was primarily designed as a stern trawler for use in high sea fisheries investigations with emphasis on midwater and bottom trawling. Pertinent features of design, equipment, appurtenances, arrangement, and location are described in some detail for the benefit of interested groups or organizations who may be planning to build or outfit vessels of their own for similar use.

267. Published in 1968.

268. Report of the Bureau of Commercial Fisheries Biological Laboratory, Galveston, Texas fiscal year 1966. By Milton J. Lindner and Robert E. Stevenson. September 1967, iii + 43 pp., 49 figs., 5 tables.

ABSTRACT

A progress report of the research at the Laboratory in Galveston. Emphasis is on shrimp, and the research involves the fields of biology, population dynamics, ecology, experimental biology, and oceanography.

269. Published in 1968.

270. Annual Report of the Bureau of Commercial Fisheries Radiobiological Laboratory Beaufort, N.C. for the fiscal year ending June 30, 1966. By T. R. Rice. December 1967, iii + 39 pp., 35 figs., 19 tables.

(No abstract.)

271. Field guide to eastern Pacific and Hawaiian sharks. By Susumu Kato, Stewart Springer and Mary H. Wagner. December 1967, 47 pp., 75 figs.

ABSTRACT

Illustrations, descriptions, and keys to the identification of more than 70 species of sharks are presented.

272. Organizing the research report to reveal the units of research. By F. Bruce Sanford. December 1967, iii + 9 pp., 9 figs.

ABSTRACT

As a research project becomes increasingly complex, the traditional outline used to report the research becomes less satisfactory. The reason is that the traditional outline tends to dismember the basic units of the research and to regroup the parts in such a manner that the whole is obscured. Suggested here is a model that will help the researcher organize his report in such a way that the basic units are kept intact and their identity is revealed regardless of how complex the research may be.

273. Design of the MV *Delaware II*. By Keith A. Smith. October 1967, iii + 8 pp., 2 figs., 2 tables.

ABSTRACT

This exploratory fishing and gear research vessel of the Bureau of Commercial Fisheries was designed as a stern ramp trawler of 155.5 feet length overall and is under construction in South Portland, Maine. Delivery is scheduled for spring 1968. The new vessel will be operated by the Exploratory Fishing and Gear Research Base at Gloucester, Mass. Special efforts were made to design an efficient stern trawler with a mechanized trawl handling system. The design provides capability for side trawling, clam and scallop dredging, longlining, gill netting, and purse seining as well as for handling experimental fishing units and systems. The vessel will be powered by a 1,000-hp. diesel engine. The designed service speed is 12.5 knots, cruising radius is 8,000 miles, and the capacity for sustained operation at sea is 30 days.

274. Progress in 1965-66 at the Bureau of Commercial Fisheries Biological Laboratory, Honolulu. By Thomas A. Manar. August 1967, 51 pp., 30 figs.

ABSTRACT

This report deals with research results achieved by the Bureau of Commercial Fisheries Biological Laboratory in Honolulu from July 1, 1965, to December 31, 1966. Stressed are the studies which have provided the first numerical estimates of the size of the skipjack tuna population of the central Pacific Ocean, an untapped stock of fishes that could hugely increase the U.S. tuna catch. Investigations with a new, sophisticated sonar and a small two-man submarine are also described. Publications issued or in press during the period are listed.

275. Fur seal industry of the Pribilof Islands, 1786-1965. By Francis Riley. October 1967, vi + 12 pp.

(No abstract.)

276. Fatty acid composition of fish oils. By Edward H. Gruger, Jr. December 1967, 30 pp., 3 tables.

(No abstract.)

277. Production of fish oil. By George M. Pigott. December 1967, 10 pp., 5 figs.

(No abstract.)

278. Industrial use of fish oils. By H. Fineberg and Arnold G. Johanson. December 1967, 17 pp., 9 tables.

(No abstract.)

279. Use of fish oils in margarine and shortening. By J. Hannewijk. December 1967, 19 pp., 3 figs., 1 table.

(No abstract.)

280. Misconceptions about nutritional properties of fish oils. By M. E. Stansby. December 1967, 6 pp.

(No abstract.)

281. Nutritional value of fish oils as animal feed. By Neva L. Karrick. December 1967, 21 pp., 1 table.

(No abstract.)

282. Fish oil industry in South America. By J. R. Sánchez Torres. December 1967, 11 pp., 1 fig., 4 tables.

(No abstract.)

Data Report

(Hard copies of Data Reports Nos. 19 through 22 are for sale at $3.00 each by the U.S. Department of Commerce, National Technical Information Service, 5285 Port Royal Road, Springfield, VA 22151.)

15. Northeast Pacific albacore-oceanography data, 1962-64. By R. W. Owen, Jr. 1967, 47 pp. on 1 microfiche.

ABSTRACT

Oceanographic data are presented for the region bounded by the coast of Oregon-Washington and long. 130°W. from lat. 41° N. to 48° N. in July of the years 1962-64. Observations and computed values are reported at observed and interpolated depths that extend from the sea surface to more than 1,000 m.; these include water temperature, salinity, density, dynamic height, and oxygen concentration. Standard weather observations are reported, as well as solar radiation measurements, chlorophyll a concentration, and albacore catches.

16. Counts of larval penaeid shrimp and oceanographic data from the Tortugas Shelf, Florida, 1962-64. By J. L. Munro and D. Dimitriou. 1967, 40 pp. on 1 microfiche.

ABSTRACT

This report presents a computer print-out of data gathered during investigations of the abundance and distribution of larvae of pink shrimp, *Penaeus duorarum*. Penaeid genera counted and staged include *Penaeus, Trachypeneus, Sicyonia, Parapenaeus,* and *Penaeopsis*. Routine oceanographic measurements are included.

17. Research on pink salmon at Little Port Walter, Alaska, 1934-64. By Jerrold M. Olson and William J. McNeil. 1967, 301 pp. on 5 microfiche.

ABSTRACT

A research station was established in 1934 at Sashin Creek on Little Port Walter Bay, Baranof Island, southeastern Alaska. This report summarizes in tables the data collected since that time on migrations of pink salmon (*Oncorhynchus gorbuscha*), chum salmon (*O. keta*), and coho salmon (*O. kisutch*) to Sashin Creek, and on the environment in the bay. A list is given of published and unpublished reports about specific problems studied at Little Port Walter.

18. Oceanographic observations, 1964, east coast of the United States. By Joseph Chase. 1967, 181 pp. on 3 microfiche.

ABSTRACT

Daily water temperature and salinity observations for 1964 for 15 locations along the Atlantic seaboard are tabulated, plotted, and discussed.

19. Recoveries of marked pin shrimp, *Penaeus duorarum* Burkenroad, released on the Florida, Tortugas grounds in 1965. By Charles E. Knight and Richard J. Berry. 1967, 83 pp. on 2 microfiche.

ABSTRACT

In the course of two studies on the Tortugas fishing grounds in 1965, Bureau of Commercial Fisheries personnel stain marked and released 18,804 pink shrimp. Of these, 7,106 were recaptured by the commercial fishing fleet. This report contains information on dates and locations of release and recaptures of shrimp, identification of vessels that caught marked shrimp, and data on sex, length, and weight of the shrimp recovered.

20. A hydrographic atlas of larger North Carolina sounds. By Austin B. Williams, Gerald S. Posner, William J. Woods, and Earl E. Deubler, Jr. 1967, 135 pp. on 3 microfiche.

ABSTRACT

An atlas of figures, tables, and short text provides a summary of salinity-temperature data for coastal North Carolina in files of the University of North Carolina Institute of Marine Sciences. Mean monthly surface and bottom isohalines and isotherms are depicted in a series of 48 figures. Monthly means and extremes for salinity-temperature values are listed in tables for 76 fixed stations.

21. Distribution of physical-chemical properties and tabulations of station data, Washing-

ton and British Columbia coasts, October-November 1963. By W. James Ingraham, Jr. 1967, 117 pp. on 2 microfiche.

ABSTRACT

Physical-chemical oceanographic data collected off the coasts of Washington and British Columbia during Cruise No. 63-4 of the R.V. *George B. Kelez* from October 23 to November 24, 1963, are presented. Seventy-four stations were occupied within 220 km. of shore. Temperature, salinity, density and dissolved oxygen values at varying depths to a maximum of 2,700 m. are tabulated. The following are presented: vertical sections of temperature, salinity, dissolved oxygen, and density from 0 to 3,000 m. and 0 to 300 m.; surface temperature and salinity; temperature, salinity, and dissolved oxygen near the bottom along the continental terrace; charts of anomalies of dynamic heights, 0/1,500 and 200/1,500 db.; and volume transports, 0/1,500 db.

22. Fishes and juvenile stages of pink shrimp (*Penaeus duorarum*) collected in Buttonwood Canal, Florida, December 1962 to June 1965. By B. J. Yokel, M. A. Roessler, and E. S. Iversen. 1967, 58 pp. on 1 microfiche.

ABSTRACT

A stationary, 19.1-mm. stretched-mesh net which relied on tidal currents for its effectiveness was used for the sampling. Total catches and hydrographic and meteorological observations are given for each ½-hour sample. "Average" hydrological and meterological conditions are summarized for each tide. Relative abundance of animals and sizes and sex ratios of pink shrimp are also reported.

Fishery Industrial Research

Vol. 3, No. 4. Extending the shelf life of frozen cisco (*Coregonus artedii*) products through the use of water-soluble antioxidants. By R. A. Greig, J. A. Emerson, and G. W. Fliehman. May 1967, pp. 1-10, 4 figs., 8 tables.

ABSTRACT

The effectiveness of various water-soluble antioxidants for retarding the development of rancididity in frozen cisco (lake herring) products was studied. Ascorbic acid was found to be more effective than propyl gallate, monsodium glutamate, or sodium tripolyphosphate. At 0° F., ascorbic acid extended the shelf life of frozen cisco portions and fillets at least twofold.

Vol. 3, No. 4. Technological studies of Dungeness crab processing Part 3 — laboratory experiments in the control of drain time. By Harold J. Barnett, Richard W. Nelson, and John A. Dassow. May 1967, pp. 11-17, 6 tables.

ABSTRACT

This study indicates the possibility of improving consumer acceptability of Dungeness crab-meat products by controlling drain-time procedures closely. Specifically, it indicates that the drained weight of crab body and leg meat can be controlled within narrower limits than is customary and that the amount of unsightly nutrient-eluting thaw fluids can be markedly decreased. The result is a product of higher quality.

Vol. 3, No. 4. Temperature, weight, and drip changes during precooking of tuna. By Alexander M. Dollar, Andrew Goldner, and Harold S. Olcott May 1967, pp. 19-23, 3 figs., 3 tables.

ABSTRACT

Changes in temperature, weight, and drip of tuna during precooking under commercial conditions were studied. The increase in internal temperature during precooking was delayed by incomplete thawing of the tuna prior to the cooking. Solids in the collected drip averaged from 3 to 4 percent of the drip. The pH of the drip remained virtually constant at 6.3 or 6.4 as the cooking progressed.

Vol. 3, No. 4. Efficacy of fish oils in healing wounds and burns. By Maurice E. Stansby, Paul E. Zollman, and R. K. Winkelmann. May 1967, pp. 25-27, 1 table.

ABSTRACT

Traditionally, fish oils are purported to effect rapid or improved healing of skin lesions, such as wounds and burns. To test this belief, we carried out an experimental study on hairless mice, which were given reproducible cuts or burns and treated with various types of fish oil. Experimental treatments included the use of (1) menhaden oil containing glyceryl ethers, (2) cod-liver oil containing a considerable amount of vitamin A, (3) a highly unsaturated fish oil (menhaden) without additives, (4) a commercially prepared ointment containing cod-liver oil, and (5) a laboratory prepared ointment also containing cod-liver oil. Control treatments included the use of (1) mineral oil, (2) the use of an ointment containing no fish oil, and (3) no treatment whatever. Completely negative results were obtained except that, in some cases, the use of any oil, including mineral oil, shortened healing time.

Vol. 3, No. 4. Chemical composition of commercially important fish of the United States. By Maurice E. Stansby and Alice S. Hall. May 1967, pp. 29-46, 13 tables.

ABSTRACT

The chemical composition of fish varies widely from species to species and also from fish to fish within a given species. Data on the composition of important American food fish are tabulated with respect to proximate composition, content of water,

minerals, proteins, amino acids, lipids, vitamins, and other constituents.

Vol. 3, No. 4. Author index of publications and addresses — 1965 Bureau of Commercial Fisheries Division of Economics and Branches of Reports (Seattle) and technology. By Helen E. Plastino and Mary S. Fukuyama. May 1967, pp. 47-58.

(No abstract.)

Vol. 4, No. 1. Relation of quality of canned yellowfin tuna (*Thunnus albacares*) to length of fish, time of holding on deck, frozen storage aboard vessel, and biochemical variables. By W. Duane Brown, Roland Finch, Tai-Wan Kwon, H. S. Olcott, and M. B. Schaefer. December 1967, pp. 1-21, 19 tables.

ABSTRACT

This paper is the second in a series reporting the results of studies of factors that affect the quality of canned tuna. The first study showed that species is a predominantly important variable; this second study was confined to a single species.

The length of the fish, the period of time the fish were held on the deck of the fishing vessel before being stowed, and the biochemical changes in the fish held in frozen storage aboard the vessel are examined, and the interrelated results are interpreted. Used as analytical tools were biochemical, sensory, and statistical analyses.

The factors most important to the quality of canned yellowfin tuna were (in order of decreasing significance): (1) the length of the fish, (2) the biochemical changes taking place in frozen storage, and (3) the period of time that the fish were held on deck after being captured.

Vol. 4, No. 1. Extending the shelf life of frozen chub (*Leucichthys hoyi*) fillets through the use of ascorbic acid dips. By R. A. Greig. December 1967, pp. 23-27, 4 figs., 1 table.

ABSTRACT

Chub fillets, prior to being frozen, were dipped in ascorbic acid solutions of three different concentrations to ascertain the comparative effectiveness of each solution in retarding the onset of rancidity in the frozen, stored fillets. Treated and nontreated fillets were examined periodically by sensory methods and by 2-thiobarbituric acid and peroxide-value tests. Results showed that all three treatments with ascorbic acid effectively extended the shelf life of the frozen fillets.

Vol. 4, No. 1. Control of salmonellae in fish meal. By B. J. Carroll and B. Q. Ward. December 1967, pp. 29-36, 2 figs., 3 tables.

ABSTRACT

Environmental studies showed the presence of Salmonellae in three fish-meal plants examined. Data derived from thermal studies indicate factors that should be taken into account when a meal requires processing, owing to postprocessing contamination with Salmonellae.

Protein was not significantly damaged under the time-temperature combinations studied.

Vol. 4, No. 1. Irradiation of Pacific coast fish and shellfish. 6—pretreatment with sodium tripolyphosphate. By J. Spinelli, G. Pelroy, and D. Miyauchi. December 1967, pp. 37-44, 3 figs., 6 tables.

ABSTRACT

The effects, during storage, of dipping fish fillets and steaks into sodium tripolyphosphate-salt solution prior to irradiation were evaluated relative to drip, sensory factors, and protein alteration and to spoilage microflora. In general, the dipping treatment proved beneficial.

Vol. 4, No. 1. Extending the shelf life of frozen white bass (*Roccus chrysops*) through the use of ascorbic acid dips. By R. A. Greig. December 1967, pp. 45-48, 1 fig., 1 table.

ABSTRACT

The effectiveness of ascorbic acid and ascorbic acid plus citric acid in retarding the development of rancidity in white bass fillets during frozen storage was evaluated. Sensory and 2-thiobarbituric acid tests run on both treated and untreated samples showed that ascorbic acid retarded the development of rancidity in the frozen fillets.

Vol. 4, No. 1. Relative catching efficiency of a 70-foot semiballoon shrimp trawl and a 94-foot eastern fish trawl. By Walter T. Pereyra, Hiromu Heyamoto, and Robert R. Simpson. December 1967, pp. 49-71, 7 figs., 10 tables.

ABSTRACT

The purpose of the experiment was to equate the relative catching efficiencies of a 94-foot Eastern fish trawl and a 70-foot semiballoon shrimp trawl. With the limitations that were imposed on experimental work by practical considerations, a simple, precise equation relating the catch efficiencies of the two trawls could not be developed. Nevertheless, the work yielded results by which one can make a more objective comparison of shallow- and deep-water trawl data.

Fishery Leaflet

585. Fisheries loans for vessels and gear. Anonymous. June 1967. 13 pp.

(No abstract.)

586. Published in 1966.

587-588. Published in 1965.

589-593. Published in 1966.

594. A brief history of the New England offshore fisheries. By Albert C. Jensen. March 1967, iii + 14 pp., 20 figs., 1 app.

ABSTRACT

The leaflet describes the origin and subsequent development of several of the principal offshore fisheries of New England. It traces the industry from the Colonial period when the chief catch was cod to the present day when a variety of species is caught and marketed. The fishing gear is described and illustrated, and technological developments in handling the catch at sea and ashore are briefly explained.

595-599. Published in 1966.

600. North Atlantic trawl nets. By Robert A. Bruce. August 1967, iii + 23 pp., 12 figs., 9 tables.

ABSTRACT

This leaflet is designed to answer requests for information about otter trawls currently used in the North Atlantic fisheries. Its major emphasis is on trawls used on New England trawlers, but it also includes some of the trawls used by other countries fishing the fishing grounds of the northwest Atlantic.

Data such as overall size, twines, mesh sizes, rope and wire size, roller and chain gear, flotation, rigging, and certain construction details accompany the drawings and texts for each net described. The designs cover trawls for vessels from 55 feet with 220-hp. (horsepower) engines to 250 feet with 2,400-hp. engines.

601. List of fishermen's and fish shore workers' unions in the United States. By Branch of Foreign Trade and Economic Services, Bureau of Commercial Fisheries. May 1967 (revised), iii + 9 pp.

(No abstract.)

602. Eastern Pacific halibut fishery, 1888-1965. By F. Heward Bell. September 1967, iii + 8 pp., 4 tables.

(No abstract.)

603. Atlantic mackerel fishery, 1804-1965. By Dwight L. Hoy and George M. Clark. November 1967, iii + 9 pp.

(No abstract.)

604. Graduate educational grants academic year 1968-69. Anonymous. September 1967, 5 pp.

(No abstract.)

605. List of Special Scientific Reports and Special Scientific Report—Fisheries of the U.S. Fish and Wildlife Service. Anonymous. November 1967, 50 pp.

(No abstract.)

606. Published in 1968.

607. The Mississippi oyster industry. By Bruce W. Maghan. December 1967, iii + 12 pp., 14 figs.

ABSTRACT

Mississippi coastal waters have been a source of oysters since precolonial days. The Eastern oyster reaches marketable size in 2 years in Mississippi. All reefs are within the limits of the Mississippi Sound, and the Mississippi Marine Conservation Commission has jurisdiction over reef rehabilitation, preservation, and expansion. This report describes how productive areas are maintained and how certain reefs are lost because of municipal and industrial wastes. It explains methods and equipment used in harvesting oysters since establishment of the fishery and shows annual landings, their value, and the number of fishermen in the fishery from 1928 to 1965.

608-609. Published in 1968.

610. Statistics of the vessels documented as fishing craft 1957-66. By Charles H. Lyles. December 1967, 62 pp., 3 figs.

(No abstract.)

611. Published in 1968.

612. List of fishery cooperatives in the United States, 1967-68. By Leslie D. McMullin. October 1967 (Revised), iii + 13 pp.

ABSTRACT

Seventy-seven fishery cooperatives in 15 States and Puerto Rico are listed. Also included in most instances are the name of one of the officers of each co-op, the number of members, the number of boats owned by members, the type of cooperative, and the major species of fish and shellfish caught.

Special Scientific Report–Fisheries

537. Pelagic fur seal investigations, 1965. By Clifford H. Fiscus and Hiroshi Kajimura. February 1967, iv + 42 pp., 4 figs., 14 apps figs., 7 tables, 19 apps tables.

ABSTRACT

Pelagic fur seal research as required by the Interim Convention on Conservation of North Pacific Fur Seals was conducted off Washington (2-24 April) and off California (11 April to 23 June). One hundred forty-seven fur seals (*Callorhinus ursinus*) were taken off Washington and 269 off California. Off Washington, seals were most numerous near Grays Harbor in mid-April. Off California, seals were concentrated off Monterey from late April to early June and near Cordell Bank west of Pt. Reyes in April and early May. Observation or transect lines extending from 10 to 80 miles offshore were established between Bodega Head and Pt. Sur, Calif., at 20-mile intervals, to study distribution and migration. Seals were most abundant from 30 to 40 miles offshore. Of the 387 female seals taken, 44 percent were pregnant; the youngest pregnant females were 5 years old. A squid, *Moroteuthis robusta*, is reported for the first time as fur seal food. By volume, the principal species of fish eaten by seals off California was *Merluccius productus* and off Washington was *Engraulis mordax*.

538-542. Published in 1966.

543. Inventory of U.S. exploratory longline fishing effort and catch rates for tunas and swordfish in the Northwestern Atlantic, 1957-65. By Peter C. Wilson and Martin R. Bartlett. February 1967, v + 52 pp., 81 figs., 13 tables.

ABSTRACT

This report summarizes the results of longline explorations for tunas and swordfish by the Bureau of Commercial Fisheries and the Woods Hole Oceanographic Institution in the Northwestern Atlantic from March 1957 to June 1965. Fishing log data from 31 exploratory cruises are summarized in 12 monthly tables that give the date, time, position, number of hooks fished and catch for each longline set. The total and monthly fishing effort (number of longline sets and hooks fished within each 1° latitude and longitude square) is shown by 13 figures. Similar figures show the total and monthly average and maximum number of bluefin, yellowfin, albacore, and bigeye tunas, and swordfish caught per 100 hooks within each 1° square. Two figures show the monthly catch rates for blackfin and skipjack tunas by 1° squares.

544. Abundance and distribution of zooplankton in Hawaiian waters, 1955-56. By Eugene L. Nakamura. May 1967, v + 37 pp., 18 figs., 15 tables, 17 app. tables.

ABSTRACT

Methods and results of a study of zooplankton are described. Sampling was conducted on eight cruises by vessels of the Bureau of Commercial Fisheries Biological Laboratory, Honolulu, and on nine cruises by the motor vessel *Makua* of the Hawaii Division of Fish and Game. Sampling included oblique hauls with a single open net at 0 to 60 m. and 0 to 200 m., and three nets towed simultaneously at three levels: an open net at 0 to 60 m. and closing nets at 70 to 130 and at 140 to 200 m. (estimated depths).

The catches from the three-net hauls revealed a greater abundance of zooplankton in the uppermost layer than in deeper water regardless of the time of sampling. Differences existed between windward and leeward areas of the island of Oahu at certain times, but one area did not have consistently greater volumes of zooplankton than the other area throughout the seasons. The significance of seasonal differences was masked by the possibility of annual fluctuations.

Composition of plankton varied by depth, season, and area. Relative abundance was comparatively stable with depth and season. Decapod crustaceans were consistently more abundant in the windward than in the leeward area. *Halosphaera viridis*, a planktonic alga, was sometimes very numerous. Various groups of zooplankton exhibited conspicuous diel movement.

545. Evaluation of a pump and reeled hose system for studying the vertical distribution of small plankton. By Roderick Leong, January 1967, iii + 9 pp., 6 figs., 2 tables.

ABSTRACT

The system consists of a submerged pump that delivers water from sampling depth to inboard filters through a long hose. It features a special winch that can store more than 120 m. of collapsible, large-diameter hose. Sources of error due to fragmentation and dispersion of organisms during passage through the system, and escapement through the strainers, were examined. Fragmentation may be excessive if animals are fragile or longer than 5 mm. Organisms that enter the system simultaneously may become widely dispersed but most remain together. Strainers of 100μ mesh (bar measure) retain organisms as narrow as 100μ.

The capabilities of the pump were illustrated by its use in obtaining vertical profiles of abundance of eggs and larvae of sardines (*Sardinops caerulea*) and of chaetognaths and doliolids at one station. The eggs and larvae were clearly restricted to the upper mixed layer and upper part of the thermocline. Numbers of chaetognaths increased and numbers of doliolids decreased with increasing depth. The advantages and limitations of the pump for studying vertical distribution are discussed.

546. Longline fishing for deep-swimming tunas in the Marquesas Islands and adjacent areas. By Howard O. Yoshida. April 1967, iii + 10 pp., 10 figs., 3 tables.

ABSTRACT

Six hundred forty-two tuna, including 438 yellowfin tuna (*Thunnus albacares*), 102 bigeye tuna (*T. obesus*), 51 albacore (*T. alalunga*), and 51 skipjack tuna (*Katsuwonus pelamis*), were caught by longline fishing on three cruises across the Equator on long. 132° and 150° W. and around the Marquesas Islands (ca. long. 140° W.) between August 1956 and May 1958. These cruises were part of an investigation of fishery resources of the Marquesan area by the Bureau of Commercial Fisheries Biological Laboratory at Honolulu.

The distribution and abundance of yellowfin tuna are considered in greatest detail in this report, because this species dominated the catches. Yellowfin tuna were more abundant during the Southern Hemisphere summer than winter and on long. 132° W. than on long. 150° W.; also, they were more numerous in the "inshore," <148 kilometers (80 nautical miles) from land, waters of the Marquesas than in the adjacent "oceanic" (>148 kilometers from land) waters. Their abundance differed seasonally in the insular waters of the Marquesas.

Although bigeye tuna were not as abundant nor as widely distributed, their distribution was somewhat similar to that of yellowfin tuna.

No albacore were caught north of lat. 7° S. on long. 132° and 150° W. This distribution appeared to be associated with a discontinuity of the oceanic structure extending east-west around lat. 10° S.

547. Response of migrating adult salmonids to vertical and horizontal rectangular orifices at two depths. By Clark S. Thompson, William Spencer Davis, and Emil Slatick. June 1967, iii + 8 pp., 7 figs., 5 tables.

ABSTRACT

The response of migrating adult salmonids to various placements of rectangular fishway orifices was studied at the Fisheries-Engineering Research Laboratory, on the Washington end of Bonneville Dam. Chinook salmon (*Oncorhynchus tshawytscha*), steelhead trout (*Salmo gairdneri*), and coho salmon (*O. kisutch*) approaching a vertical wall had the alternatives of entering rectangular orifices positioned either horizontally or vertically and either shallow (3 feet) or deep (9 feet). The responses of the three species to the various orifice conditions are analyzed. More migrants passed through shallow orifices than deep orifices, and more salmonids entered vertical orifices than horizontal orifices.

584. Expendable bathythermograph data on subsurface thermal structure in the eastern North Pacific Ocean. By J. F. T. Saur and Dorothy D. Stewart. August 1967, iii + 70 pp., 9 figs., 13 tables, 50 charts.

ABSTRACT

This report contains reproductions of original temperature-depth traces, two temperature sections, and synoptic weather observations taken between San Francisco and Honolulu in November-December 1965, using an expendable bathythermograph system aboard a merchant ship. A third temperature section derived from closely spaced observations shows the complicated temperature structure with temperature maximums and minimums over a distance of about 45 nautical miles (85 km.) across the outer boundary of the California Current.

549. Atlas of July oceanographic conditions in the Northeast Pacific Ocean, 1961-64. By R. W. Owen, Jr. January 1967, vi + 85 pp., 82 figs.

ABSTRACT

An atlas of July oceanographic conditions in 1961-64 is presented for the region bounded by the coast of Oregon-Washington and long. 132° W. The atlas consists of charts that show distributions of temperature, salinity, density, oxygen concentration, thickness of mixed layer, dynamic height, chlorophyll *a* concentration, and catch of albacore, *Thunnus alalunga* (Bonnaterre), at the time of year when albacore first become available to the commercial fishery of the region. Some remarks on the albacore catch and the environment are included.

550. Biology and management of the American shad and status of the fisheries, Atlantic Coast of the United States, 1960. By Charles H. Walburg and Paul R. Nichols. August 1967, iv + 105 pp., 33 figs., 55 tables.

ABSTRACT

This paper summarizes current information on the American shad, *Alosa sapidissima*, and describes the species and its fishery. Emphasis is placed on (1) life history of the fish, (2) condition of the fishery by State and water area in 1960 compared to 1896 when the last comprehensive description was made, (3) factors responsible for decline in abundance, and (4) management measures.

The shad fishery has changed little over the past three-quarters of a century, except in magnitude of yield. Types of shad-fishing gear have remained relatively unchanged, but many improvements have been made in fishing techniques, mostly to achieve economy.

In 1896 the estimated catch was more than 50 million pounds. New Jersey ranked first in production with about 14 million pounds, and Virginia second with 11 million pounds. In 1960 the estimated catch was slightly more than 8 million pounds. Maryland ranked first in production with slightly more than 1.5 million pounds, Virginia second with slightly less than 1.4 million pounds, and North Carolina third with about 1.3 million pounds.

Biological and economic factors blamed for the decline in shad abundance, such as physical changes in the environment, construction of dams, pollution, overfishing, and natural cycles of abundance, are discussed. Also discussed are methods used for

the rehabilitation and management of the fishery, such as artificial propagation, installation of fish-passage facilities at impoundments, and fishing regulations.

With our present knowledge, we can manage individual shad populations; but, we probably cannot restore the shad to its former peak of abundance.

551. Preliminary report on the feeding habits of tunas in the Gulf of Guinea. By Paul N. Sund and William J. Richards. July 1967, iii + 6 pp., 1 fig, 2 tables.

ABSTRACT

The stomachs of 171 yellowfin tuna (*Thunnus albacares*) and 72 skipjack tuna (*Katsuwonus pelamis*), captured in the Gulf of Guinea, contained mostly fishes, cephalopods, and crustaceans. The percentage composition by volume of these three food categories was: 55, 19, and 8 for yellowfin tuna; 96, 1, and 2 for skipjack tuna. The percentage frequency of occurrence was: 76, 40, and 53 for yellowfin tuna; 73, 14, and 22 for skipjack tuna. The occurrence of forage species varied little in geographic areas within the region, but differences did occur between the food species found in stomachs of fish captured in the "warm" and "cool" seasons. A trematode parasite of the genus *Hirudinella* was found in stomachs of both tuna species.

552. The Trade Wind Zone Oceanography Pilot Study Part 1: *Townsend Cromwell* cruises 1, 2, and 3 February to April 1964. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, v + 75 pp., 28 figs., 3 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26° N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the first set of three cruises, *Townsend Cromwell* cruises 1, 2, and 3, February to April 1964, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,000 m. (cruise 1), and 1,200 m. (cruises 2 and 3) are shown in charts for each cruise. Methods and procedures as well as the limitations of the data are discussed.

553. The Trade Wind Zone Oceanography Pilot Study Part II: *Townsend Cromwell* cruises 4, 5, and 6 May to July 1964. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, v + 78 pp., 28 figs., 3 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26° N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the second set of three cruises, *Townsend Cromwell* cruises 4, 5, and 6, May to July 1964, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,200 m. are shown in charts for each cruise. Methods and procedures as well as the limitations of the data are discussed.

554. The Trade Wind Zone Oceanography Pilot Study Part III: *Townsend Cromwell* cruises 8, 9, and 10 September to November 1964. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, v + 78 pp., 28 figs., 3 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26° N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the third set of three cruises, *Townsend Cromwell* cruises 8, 9, and 10, September to November 1964, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,200 m. for cruises 8 and 9 and 1,000 m. for cruise 10. Methods and procedures as well as the limitations of the data are discussed.

555. The Trade Wind Zone Oceanography Pilot Study Part IV: *Townsend Cromwell* cruises 11, 12, and 13 December 1964 to February 1965. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, v + 78 pp., 28 figs., 3 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26° N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the fourth set of three cruises, *Townsend Cromwell* cruises 11, 12, and 13, December 1964 to February 1965, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,200 m. are shown in charts for each cruise. Methods and procedures as well as the limitations of the data are discussed.

556. The Trade Wind Zone Oceanography Pilot Study Part V: *Townsend Cromwell* cruises 14 and 15 March and April 1965. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, v + 54 pp., 19 figs., 2 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26° N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the fifth set of two cruises, *Townsend Cromwell* cruises 14 and 15, March and April 1965, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,200 m. are shown in charts for each cruise. Methods and procedures as well as the limitations of the data are discussed.

557. The Trade Wind Zone Oceanography Pilot Study Part VI: *Townsend Cromwell* cruises 16, 17, and 21 May and June 1965 and January 1966. By Robert L. Charnell, David W. K. Au, and Gunter R. Seckel. June 1967, iv + 59 pp., 20 figs., 3 tables.

ABSTRACT

A standard grid of oceanographic stations in an area bounded by lat. 10° and 26°N., and long. 148° and 157° W., was occupied at monthly intervals between February 1964 and June 1965. For the last regular cruises, *Townsend Cromwell* cruises 16 and 17, May and June 1965, oceanographic station data are tabulated, BT data are presented in vertical sections, and the distribution of surface temperature, surface salinity, and surface dynamic height relative to 1,200 m. are shown in charts for each cruise. Methods and procedures as well as the limitations of the data are discussed. Oceanographic station data from *Townsend Cromwell* cruise 21 in January 1966, consisting of a single profile of stations between lat. 10° and 26.5° N. along long. 154° W., have been included.

558. Geographical index to collecting stations of the exploratory fishing vessels *Oregon, Silver Bay, Combat,* and *Pelican* 1950-65. By Frederick H. Berry and Shelby Drummond. October 1967, iii + 25 pp., 1 fig., 5 tables.

ABSTRACT

Geographic locality designations are applied to collecting stations of four Bureau of Commercial Fisheries exploratory fishing vessels during 1950-65 in the western Atlantic.

559. Published in 1968.

560. Surface-to-bottom pot fishing for pandalid shrimp. By Louis Barr and Roland McBride. December 1967, iii + 7 pp., 6 figs.

ABSTRACT

Baited shrimp pots were used to study the seasonal and diel changes in vertical distributions of several species of pandalid shrimp (primarily *Pandalus borealis, P. goniurus,* and *P. hypsinotus*) in Kachemak Bay, Alaska. This method has good potential for sampling shrimp populations in untrawlable areas.

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